We claim:

1. A method of joining a pair of metal components comprising the steps of:

(a) placing a first metal component having a first exposed continuous surface and a second metal component having a second exposed surface in overlapping relationship to each other;

(b) providing a metal rivet having a head and a tip opposite the head for entering into the first and second components; and

(c) rotating the rivet about its longitudinal axis and simultaneously plunging the rivet through the first component continuous surface and into the second component, wherein the hardness of the metal rivet is substantially similar to the hardness of at least one of the first and second components, such that the metal of the rivet and the first and second components plastically deform; and

(d) solidifying the plasticized metal to produce a joint between the rivet and each of the first and second components.

2. The method of claim 1 wherein the rivet tip is pointed.

3. The method of claim 2 wherein a final position of the rivet tip is within the second component.

4. The method of claim 3 wherein the rivet tip raises a portion of the second exposed surface.

5. The method of claim 4 wherein the raised portion has a semispherical configuration.

6. The method of claim 4 wherein the first and second components are held together between a clamp positioned on the first exposed surface and a backing anvil positioned against the second exposed surface, wherein the backing anvil defines a recess which receives the raised portion and deforms the raised portion into the configuration of the recess.

7. The method of claim 2 wherein a final position of the rivet tip is flush with the second exposed surface.

8. The method of claim 7 wherein the first and second components are held together between a clamp positioned on the first exposed surface and a backing anvil positioned against the second component, wherein the backing anvil has a substantially planar surface against which the rivet abuts to maintain the rivet tip flush with the second exposed surface.

9. The method of claim 2 wherein a final position of the rivet tip exterior to the second component.

10. The method of claim 1 wherein at least one of the first and second components is preheated prior to plunging the rivet therein.

11. The method of claim 1 wherein the rivet defines a helical groove along an exterior surface of the rivet.

12. The method of claim 1 wherein the rivet includes means for hiding flash produced in the step of plunging and rotating the rivet.

13. The method of claim 12 wherein the rivet includes a flange and a lip extending therefrom, the flange and lip thereby defining a recess for collecting flash between the rivet and the first exposed surface.

14. The method of claim 1 wherein the rivet tip defines a bore.

15. The method of claim 14 wherein the bore extends partially through the rivet.

16. The method of claim 14 wherein the bore extends completely through the rivet.

17. The method of claim 1 wherein the head of the rivet includes means for engaging another component.

18. The method of claim 1 further comprising joining a third metal component to the second component by the steps of:

(i) positioning the third component having a third exposed surface in overlapping relationship to the second exposed surface;

(ii) providing another metal rivet having a head and a tip opposite the head for entering into the third and second components; and

(iii) rotating the other rivet about its longitudinal axis and simultaneously plunging the other rivet through the third component exposed surface and into the second component, wherein the hardness of the other metal rivet is substantially similar to the hardness of one of the third and second components.

19. The method of claim 18 wherein the third exposed surface defines a pilot hole into which the other rivet is positioned prior to step (iii).

20. The method of claim 18 wherein steps (c) and (iii) are performed simultaneously.

21. The method of claim 1 further comprising removing the rivet head following step (d).

22. The method of claim 21 wherein the rivet head is joined to a main portion of the rivet via a narrowed portion such that when the plasticized metal solidifies, the rivet head breaks off at the narrowed portion from the rivet main portion.

23. The method of claim 1 wherein the first and second metal components and the rivet each comprise aluminum or an aluminum alloy.

24. The method of claim 23 wherein at least one of the first and second metal components is a clad product.

25. A composite metal product comprising:

a first metal component having a first exposed surface;

a second metal component underlying the first component; and

a metal rivet extending from said first exposed surface into the second metal component, said rivet being friction welded to each of said first and second components, wherein the metal of said rivet has a hardness substantially similar to at least one of the first and second metal components.

26. The composite metal product of claim 25 wherein the first metal and second metal components and the rivet each comprise aluminum or an aluminum alloy.

27. The composite metal product of claim 26 wherein at least one of the first and second metal components is a clad product.

28. The composite metal product of claim 25 wherein at least about 50 % of the alloying components the first and second components and the rivet are the same.

29. A system for joining a first metal component to a second metal component with a rivet, wherein the hardness of the rivet is substantially similar to the hardness of at least one of the first and second components, said system comprising:

a clamp positioned on a continuous first exposed surface of the first component for maintaining the first component adjacent the second component;

a backing anvil for supporting a second exposed surface of the second component adjacent the first component; and

means for rotating and plunging the rivet through the continuous first exposed surface and into the second component to produce a region of plasticized metal between the rivet and each of the first and second components, the plasticized metal being solidifiable to form a friction weld between the rivet and each of the first and second components.

30. The system of claim 29 further comprising means for removing flash produced when the rivet is friction welded to the first and second components.

31. The system of claim 29 where said means for removing flash comprises a moveable member linked to said means for rotating, said moveable member configured to move about the rivet to remove the flash.

32. The system of claim 31 wherein said rotating means is disengagable from the rivet to allow the friction weld to solidify while said moveable member continues to move about the rivet.